

HYPERNUMBERS AND OTHER EXOTIC STUFF



(1) MORE ON THE "ARITHMETICAL" SIDE

Arborescent numbers: higher arithmetic operations and division trees - Henryk Trappmann

http://eretrandre.org/rb/files/Trappmann2007_81.pdf

Tetration Reference - Henryk Trappman and Andrew Robbins - <https://math.eretrandre.org/tetrationforum/attachment.php?aid=387>

Applications - <https://math.stackexchange.com/questions/199862/what-is-the-geometric-physical-or-other-meaning-of-the-tetration>

Publications - <https://math.eretrandre.org/publications.html>

The family of arithmetics of Ruggero Maria Santilli - <http://www.santilli-foundation.org/docs/10.11648.j.ajmp.s.2015040501.14.pdf>

Isodual Theory of Antimatter with applications to Antigravity, Grand Unification and Cosmology

<https://www.amazon.com/Isodual-Theory-Antimatter-applications-Antigravity/dp/1402045174> (book)

Studies on Santilli's Isonumber Theory - Arun S. Muktibodh - <http://www.santilli-foundation.org/docs/pdf2.pdf>

Elements of Hadronic Mechanics III Experimental verifications - R.M.Santilli

<http://www.santilli-foundation.org/docs/elements-hadronic-mechanics-iii.compressed.pdf>

Initiating Santilli's Iso-Mathematics to Triplex Number... - Nathan O. Schmidt and Reza Katebi - <http://vixra.org/pdf/1308.0051v2.pdf>

<http://thunder-energies.com/> && <http://www.santilli-foundation.org>

Saturation Arithmetic - https://en.wikipedia.org/wiki/Saturation_arithmetic

Symmetric level index - https://en.wikipedia.org/wiki/Symmetric_level-index_arithmetic

A Hybrid Number Representation Scheme Based on Symmetric Level-Index Arithmetic Xunyang Shen and Peter R. Turner

https://www.researchgate.net/publication/221142816_A_Hybrid_Number_Representation_Scheme_Based_on_Symmetric_Level-Index_Arithmetic

ZEA A zero-free exact arithmetic - Dominique Michelucci and Jean-Michel Moreau

https://www.researchgate.net/publication/220991026_ZEA_-_A_zero-free_exact_arithmetic

Algebra of screws - https://en.wikipedia.org/wiki/Screw_theory#Algebra_of_screws

On quantum state of numbers - Bernard Le Stum & Adolfo Quirós - <https://arxiv.org/pdf/1310.8143.pdf>

Half-exponential function - https://en.wikipedia.org/wiki/Half-exponential_function

Matrix exponential - https://en.wikipedia.org/wiki/Matrix_exponential

Baker–Campbell–Hausdorff formula - https://en.wikipedia.org/wiki/Baker%E2%80%93Campbell%E2%80%93Hausdorff_formula

N-ary group - https://en.wikipedia.org/wiki/N-ary_group

Circuits over sets of natural numbers - https://en.wikipedia.org/wiki/Circuits_over_sets_of_natural_numbers

The complexity of circuit evaluation over the natural numbers - Pierre McKenzie and Klaus Wagner
<http://www.iro.umontreal.ca/~mckenzie/Dagstuhl02.pdf>

The Unwinding Number - Robert M. Corless and David J. Jeffrey - <https://faculty.e-ce.uth.gr/akritas/CE102/p28-corless.pdf>

Distributive property examples - https://en.wikipedia.org/wiki/Distributive_property#Other_examples

A new arithmetic function of combinatorial significance - Solomon W Golomb - <https://core.ac.uk/reader/82660399>

A Noncommutative Version of the Natural Numbers - Tyler Foster - <https://arxiv.org/pdf/1003.2081.pdf>

Multigrate and dividate: two new arithmetic operations - Eduard Kleihorst - <https://ieeexplore.ieee.org/document/833601>

A new number system: Remainder numbers

<https://math.stackexchange.com/questions/2415896/a-new-number-system-remainder-numbers>

Generalization of the unit interval - William M. Cornette - https://projecteuclid.org/download/pdf_1/euclid.pjm/1102818012

Structure of unital 3-fields - Steven Duplij and Wend Werner - <https://arxiv.org/pdf/1505.04393.pdf>

Ternary field - https://encyclopediaofmath.org/wiki/Ternary_field

Construction, properties and applications of finite neofield - Anthony Donald Keedwell

https://dml.cz/bitstream/handle/10338.dmlcz/119164/CommentatMathUnivCarolRetro_41-2000-2_8.pdf

Quantity calculus - https://en.wikipedia.org/wiki/Quantity_calculus

<http://ingvar.web03.cefit.se/wp-content/uploads/2016/02/physics6.pdf>

Metrological Thinking Needs the Notions of Parametric Quantities, Units, and Dimensions - Ingvar Johansson

List of humorous units of measurement - https://en.wikipedia.org/wiki/List_of_humorous_units_of_measurement

Frink - <https://frinklang.org/>

Solving Cubic Equations with Curly Roots - Dan Kalman and Maurice Burke

<https://www.jstor.org/stable/10.5951/mathteacher.108.5.0392?seq=1>

Radical of an integer - https://en.wikipedia.org/wiki/Radical_of_an_integer

Integer square root - https://en.wikipedia.org/wiki/Integer_square_root

Quadratic residue - https://en.wikipedia.org/wiki/Quadratic_residue

Hypernumbers and Extrafunctions: Extending the Classical Calculus - Mark Burgin

<https://www.amazon.com/Hypernumbers-Extrafunctions-Extending-SpringerBriefs-Mathematics/dp/1441998748>

Exponentiation by squaring - https://en.wikipedia.org/wiki/Exponentiation_by_squaring

Addition-chain exponentiation - https://en.wikipedia.org/wiki/Addition-chain_exponentiation

Egyptian fraction - https://en.wikipedia.org/wiki/Egyptian_fraction

Numerical Polynomial Algebra - Hans Jörg Stetter (arithmetic pseudo-operations, look the chapter on 'Floating-Point Arithmetic')

<https://www.amazon.com/Numerical-Polynomial-Algebra-Hans-Stetter/dp/0898715571>

Ordinal number - https://en.wikipedia.org/wiki/Ordinal_number

Mex - [https://en.wikipedia.org/wiki/Mex_\(mathematics\)](https://en.wikipedia.org/wiki/Mex_(mathematics))

On Unconventional Division by Zero - Jakub Czajko

<http://www.worldscientificnews.com/wp-content/uploads/2018/04/WSN-99-2018-133-147.pdf>

Bouncing factorial - https://googology.fandom.com/wiki/Bouncing_Factorial

Parallel operator - [https://en.wikipedia.org/wiki/Parallel_\(operator\)](https://en.wikipedia.org/wiki/Parallel_(operator))

Fractions in transrational arithmetic - Jan A. Bregstra - <https://transmathematica.org/index.php/journal/article/view/19/23>

Derangement - <https://en.wikipedia.org/wiki/Derangement>

Superpermutation - <https://en.wikipedia.org/wiki/Superpermutation>

A lower bound on the length of the shortest superpattern - Anonymous 4chan Poster, Robin Houston, Jay Pantone, and Vince Vatter

<https://oeis.org/A180632/a180632.pdf>

Encyclopedia of Distances - Michel Marie Deza and Elena Deza

<https://www.amazon.com/Encyclopedia-Distances-Michel-Marie-Deza/dp/3662443414>

International Journal of Division by Zero Calculus - <https://romanpub.com/dbzc-vol-1--2021.php>

Introduction to the Division by Zero Calculus - Saburo Saitoh

<https://www.scirp.org/book/detailedinfofabook.aspx?bookid=2746>

Däumler's conformal mapping - <https://www.horntorus.com/manifolds/conformal.html>

Integer Part - <https://mathworld.wolfram.com/IntegerPart.html>

Standard part function - https://en.wikipedia.org/wiki/Standard_part_function

Continuum between addition, multiplication and exponentiation

<https://math.stackexchange.com/questions/1269643/continuum-between-addition-multiplication-and-exponentiation>

Los misterios de la fracción prohibida - Claudi Alsina and Carme Burgués - <https://revistasuma.es/IMG/pdf/56/039-042.pdf>

Mediant - [https://en.wikipedia.org/wiki/Mediant_\(mathematics\)](https://en.wikipedia.org/wiki/Mediant_(mathematics))

Ford circle - https://en.wikipedia.org/wiki/Ford_circle

Question mark function - https://en.wikipedia.org/wiki/Minkowski%27s_question-mark_function

The fifth arithmetical operation - <https://numbermusicrevolution.com/>

New Numerical Methods: The Rational Mean (book) - Domingo Gomez Morin (La quinta operación aritmética)

https://www.amazon.com/gp/product/1520717245/ref=dbs_a_def_rwt_hsch_vapi_tpbk_p1_i1

<https://www.youtube.com/watch?v=6IORU03yuvY>

AULOS. LA OTRA LUZ. Music and Consonance. New musical scale not based on the Octave.

https://www.youtube.com/watch?v=gbK_V_7ivDA

<https://domingogomezmorin.wordpress.com/>

atan2 - <https://en.wikipedia.org/wiki/Atan2>

hypot - https://en.wikipedia.org/wiki/Pythagorean_addition

Sinc - https://en.wikipedia.org/wiki/Sinc_function

abc Conjecture and New Mathematics - Fumiharu Kato - <https://www.youtube.com/watch?v=fNS7N04DLAQ>

Some ternary quasigroups over small sets - http://tamivox.org/dave/math/tern_quasi/index.html

Super omega - https://en.wikipedia.org/wiki/Chaitin%27s_constant#Super_Omega

The five fundamental operations of mathematics: addition, subtraction, multiplication, division, and

modular forms - Kenneth A. Ribet - <https://math.berkeley.edu/~ribet/trinity.pdf>

Engel expansion - https://en.wikipedia.org/wiki/Engel_expansion

A novel operation associated with Gauss' arithmetic-geometric means - Shinji Tanimoto

<https://arxiv.org/pdf/0708.3521.pdf> ("intermediate operation" between addition and multiplication)

Arithmetic Geometric Mean - https://en.wikipedia.org/wiki/Arithmetic%E2%80%93geometric_mean

Gauss, Landen, Ramanujan, the Arithmetic-Geometric Mean, Ellipses, π , and the Ladies Diary

Gert Almkvist and Bruce Berndt - https://link.springer.com/chapter/10.1007%2F978-3-319-32377-0_8

The total differential, the Cauchy-Riemann equations and the Elysian infinitesimals - Kerry Bemis

Rounding to other values - https://en.wikipedia.org/wiki/Rounding#Rounding_to_other_values

TriINTERCAL - <https://esolangs.org/wiki/TriINTERCAL>

TrybblePusher - <https://esolangs.org/wiki/TrybblePusher>

Heinz mean - https://en.wikipedia.org/wiki/Heinz_mean

Identric mean - https://en.wikipedia.org/wiki/Identric_mean

Logarithmic mean - https://en.wikipedia.org/wiki/Logarithmic_mean

Hypertranscendental number - https://en.wikipedia.org/wiki/Hypertranscendental_number

Infinite compositions of analytic functions - https://en.wikipedia.org/wiki/Infinite_compositions_of_analytic_functions

Monus - <https://en.wikipedia.org/wiki/Monus>

Racks and quandles - https://en.wikipedia.org/wiki/Racks_and_quandles

Absorption law - https://en.wikipedia.org/wiki/Absorption_law

Directoids - <https://math.chapman.edu/~jipsen/structures/doku.php?id=directoids>

Quasi-commutative property - https://en.wikipedia.org/wiki/Quasi-commutative_property

Jacobiator - <https://en.wikipedia.org/wiki/Jacobiator>

Bimodule - <https://planetmath.org/bimodule>

Unipotent - <https://en.wikipedia.org/wiki/Unipotent>

Near-field - [https://en.wikipedia.org/wiki/Near-field_\(mathematics\)](https://en.wikipedia.org/wiki/Near-field_(mathematics))

Smarandache Loops - W. B. Vasantha Kandasamy - <http://fs.unm.edu/Vasantha-Book4.pdf>

When Less is More Visualizing Basic Inequalities - Claudi Alsina and Roger B. Nelsen

<https://www.amazon.com/When-Less-More-Inequalities-Mathematical/dp/0883853426>

My Math, James Harris (blog) - <https://web.archive.org/web/20110928215006/http://mymath.blogspot.com/>

Collections of James Harris - <https://hismath.blogspot.com/2009/02/>

Multiplicative calculus - https://en.wikipedia.org/wiki/Multiplicative_calculus

Subderivative <https://en.wikipedia.org/wiki/Subderivative>

Fractal derivative - https://en.wikipedia.org/wiki/Fractal_derivative

A curious arithmetic of fractal dimension for polyadic Cantor sets - Francisco R. Villatoro - <https://arxiv.org/pdf/0910.5014.pdf>

Alternative mathematical notation and its applications in calculus - Jakub Marian - https://jakubmarian.com/data/bachelor_thesis.pdf

Partial fraction decomposition - https://en.wikipedia.org/wiki/Partial_fraction_decomposition

Negligible function - https://en.wikipedia.org/wiki/Negligible_function

Dialogue on n colored numbers - Armahedi Mahzar - https://issuu.com/armahedimahzar/docs/dialogue_on_n-colored_nubers

Gaussian logarithm - https://en.wikipedia.org/wiki/Gaussian_logarithm

Super-logarithm - <https://en.wikipedia.org/wiki/Super-logarithm>

The p-adic integers - Brian Courthoute, Pablo Guzman and Antoine Ronk - <http://math.uni.lu/eml/projects/reports/P-adics.pdf>

A first introduction to p-adic numbers - David A. Madore - <http://www.madore.org/~david/math/padics.pdf>

Additive number theory - https://en.wikipedia.org/wiki/Additive_number_theory

Zero-sum problem - https://en.wikipedia.org/wiki/Zero-sum_problem

Subset sum problem - https://en.wikipedia.org/wiki/Subset_sum_problem

Davenport theorem - https://en.wikipedia.org/wiki/Restricted_sumset#Cauchy%E2%80%93Davenport_theorem

Some remarks on the pseudo-linear algebra - Andrea markova - <https://www.sav.sk/journals/uploads/1203130414marko.pdf>

Pseudo-arithmetical operations as a basis for the general measure and integration theory - Pietro Benvenuti and Radko Mesiar
<https://www.sciencedirect.com/science/article/pii/S0020025503002111>

Polylogarithmic function - https://en.wikipedia.org/wiki/Polylogarithmic_function

Anti-Raemschian quantity - a conglomerate of ants at a scimathic discussion

<https://groups.google.com/g/sci.math/c/i3K3xDzmoEM/m/N5TUUsLuBgAJ>

Hofstadter sequences - https://en.wikipedia.org/wiki/Hofstadter_sequence

Mallows' Sequence - <https://mathworld.wolfram.com/MallowsSequence.html>

The Golden Trisection - <http://www.sacred-geometry.es/?q=en/content/golden-trisection>

Negative Math: How Mathematical Rules Can Be Positively Bent - Alberto A. Martínez

<https://www.amazon.com/Negative-Math-Mathematical-Rules-Positively-ebook/dp/B07DMVNZVP>

Fold - [https://en.wikipedia.org/wiki/Fold_\(higher-order_function\)](https://en.wikipedia.org/wiki/Fold_(higher-order_function))

Map - [https://en.wikipedia.org/wiki/Map_\(higher-order_function\)](https://en.wikipedia.org/wiki/Map_(higher-order_function))

Currying - <https://en.wikipedia.org/wiki/Currying>

S-unit - <https://en.wikipedia.org/wiki/S-unit>

Interval Arithmetic - https://en.wikipedia.org/wiki/Interval_arithmetic

Theories of Interval Arithmetic Mathematical Foundations and Applications - Hend Dawood

https://www.academia.edu/1976964/Theories_of_Interval_Arithmetic_Mathematical_Foundations_and_Applications

Affine arithmetic - https://en.wikipedia.org/wiki/Affine_arithmetic

A Collection of Algebraic Identities - Tito Piezas - <https://sites.google.com/site/tpiezas/Home> && <https://tpiezas.wordpress.com/>

Teoria del Neutro Piccolo - T.n.p. Socratis - <https://groups.google.com/forum/#!forum/it.scienza.matematica>

Summation $1+2+3+4+\dots$ https://en.wikipedia.org/wiki/1_%2B_2_%2B_3_%2B_4_%2B_%E2%8B%AF

Umbral Calculus - https://en.wikipedia.org/wiki/Umbral_calculus

Bernoulli umbra - https://en.wikipedia.org/wiki/Bernoulli_umbra

Progress Report on Hyper-operations (Zeration) - Constantin A. Rubtsov and Giovanni F. Romerio

<https://math.eretrandre.org/tetrationforum/attachment.php?aid=251>

Ackermann's Function and New Arithmetical Operations (zeration) - Constantin A. Rubtsov and Giovanni F. Romerio

[http://www.rotarysaluzzo.it/Z_Vecchio_Sito/filePDF/Iperoperazioni%20\(1\).pdf](http://www.rotarysaluzzo.it/Z_Vecchio_Sito/filePDF/Iperoperazioni%20(1).pdf)

Galois Imaginary - <https://mathworld.wolfram.com/GaloisImaginary.html>

Congruence Classes of Polynomials Modulo $p(x)$ over a Field

<http://mathonline.wikidot.com/congruence-classes-of-polynomials-modulo-p-x-over-a-field>

Galois Theory : 12 lessons in Modern Mathematics through Concepts and Intuition - Fumiharu Kato

<https://www.amazon.co.jp/dp/4044006822?tag=kadoofce-22>

Galois : The Life of a Genius Mathematician - Fumiharu Kato (year 2020)

https://www.amazon.co.jp/-/en/gp/product/B083Z6K9YB/ref=dbs_a_def_rwt_hsch_vapi_tkin_p1_i2

Abel and the insolubility of the quintic - Jim Brown - <http://www.math.caltech.edu/~jimlb/abel.pdf>

On the Argument of Abel - William Rowan Hamilton - <https://www.emis.de/classics/Hamilton/Abel.pdf>

Back to solving the quintic, depression and Galois primes - Semjon Adlaj - <https://pca-pdmi.ru/2018/files/13/PCA2018GP5.pdf>

Constant problem - https://en.wikipedia.org/wiki/Constant_problem

Theory of holors - Parry Moon and Domina Eberle Spencer

<https://www.amazon.com/Theory-Holors-Generalization-Moon-Spencer/dp/0521019001>

Penrose mathematical notation - https://en.wikipedia.org/wiki/Penrose_graphical_notation

Demonic composition - https://en.wikipedia.org/wiki/Demonic_composition

Chemical equation - https://en.wikipedia.org/wiki/Chemical_equation#Structure

Equipollence - [https://en.wikipedia.org/wiki/Equipollence_\(geometry\)](https://en.wikipedia.org/wiki/Equipollence_(geometry))

Converse relation - https://en.wikipedia.org/wiki/Converse_relation

Tolerance relation - https://en.wikipedia.org/wiki/Tolerance_relation

Accessibility relation - https://en.wikipedia.org/wiki/Accessibility_relation

Setoid - <https://en.wikipedia.org/wiki/Setoid>

Permutable congruences - <https://planetmath.org/PermutableCongruences>

Allegory - [https://en.wikipedia.org/wiki/Allegory_\(mathematics\)](https://en.wikipedia.org/wiki/Allegory_(mathematics))

Relational mathematics : An Introduction - Gunther Schmidt

<https://www.amazon.com/Relational-Mathematics-Encyclopedia-Applications-Book-ebook/dp/B01DM25H96>

The field $\mathbb{Q}(2\cos(\pi/n))$, its Galois group and length ratios in the regular n -gon - Wolfdieter Lang

<https://arxiv.org/pdf/1210.1018.pdf> (new equivalence relation called (Modd n))

Generalized inverse - https://en.wikipedia.org/wiki/Generalized_inverse

Permanent - [https://en.wikipedia.org/wiki/Permanent_\(mathematics\)](https://en.wikipedia.org/wiki/Permanent_(mathematics))

Supermatrix - <https://en.wikipedia.org/wiki/Supermatrix>

Hyperdeterminant - <https://en.wikipedia.org/wiki/Hyperdeterminant>

...some others can be found in https://en.wikipedia.org/wiki/List_of_types_of_numbers

(2) TROPICAL SECTION

Introduction to Tropical Geometry - Diane Maclagan and Bernd Sturmfels

<http://www.cs.technion.ac.il/~janos/COURSES/238900-13/Tropical/MaclaganSturmfels.pdf>

Min-plus matrix multiplication - https://en.wikipedia.org/wiki/Min-plus_matrix_multiplication

Tropical Geometry - https://en.wikipedia.org/wiki/Tropical_geometry

Amoeba - https://en.wikipedia.org/wiki/Amoeba_%28mathematics%29

https://www.youtube.com/watch?v=1_ZfvQ3o1Ac (friendly introduction)

Log semiring - https://en.wikipedia.org/wiki/Log_semiring

Log SumExp - <https://en.wikipedia.org/wiki/LogSumExp>

Tight spans, Isbell completions and semi-tropical modules - Simon Willerton

<https://arxiv.org/pdf/1302.4370.pdf> (one half of the tropical semiring)

Hyperfields for Tropical Geometry I. Hyperfields and dequantization - Oleg Viro

<https://arxiv.org/pdf/1006.3034.pdf> (see section "6. Tropical addition of complex numbers")

Supertropical quadratic forms II: Tropical trigonometry and applications - Zur Izhakian, Manfred Knebusch and Louis Rowen

https://www.researchgate.net/publication/326630264_Supertropical_Quadratic_forms_II_Tropical_Trigonometry_and_Applications

Tropical projective space - https://en.wikipedia.org/wiki/Tropical_projective_space

Tropical geometry to analyse demand - Elizabeth Baldwin and Paul Klemperer

http://elizabeth-baldwin.me.uk/papers/baldwin_klemperer_2014_tropical.pdf

International Trade Theory and Exotic Algebras - Yoshinori Shiozawa

<https://link.springer.com/article/10.1007/s40844-015-0012-3>

Complete Tropical Bezout's Theorem and Intersection Theory theory in the tropical projective plane - Gretchen Rimmasch

<https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=2504&context=etd>

(3) NUMERALS ON THE NUMERIC

Lunar Arithmetic or Dismal Arithmetics - David Applegate, Marc LeBrun and N. J. A. Sloane

<https://cs.uwaterloo.ca/journals/JIS/VOL14/Sloane/carry2.pdf>

<https://www.youtube.com/watch?v=cZkGeR9CWbk>

Balanced Ternary - https://en.wikipedia.org/wiki/Balanced_ternary

https://pt.wikipedia.org/wiki/Tern%C3%A1rio_balanceado#/media/Ficheiro:Balanced_ternary.svg

Double-Base Number System for Multi-Scalar Multiplications - Christophe Doche, David R. Kohel and Francesco Sica

<https://www.iacr.org/archive/eurocrypt2009/54790501/54790501.pdf>

Skew binary number system - https://en.wikipedia.org/wiki/Skew_binary_number_system

Two Skew-Binary Numeral Systems and One Application - Amr Elmasry and Jyrki Katajainen

<http://cphstl.dk/Paper/TOCS-2011/journal.pdf>

Zero Displacement Ternary Number System : the most economical way of representing numbers

Fernando Guilherme and Silvano Lobo Pimentel

[https://www.researchgate.net/publication/](https://www.researchgate.net/publication/258241283_Zero_Displacement_Ternary_Number_System_the_most_economical_way_of_representing_numbers)

[258241283_Zero_Displacement_Ternary_Number_System_the_most_economical_way_of_representing_numbers](https://www.researchgate.net/publication/258241283_Zero_Displacement_Ternary_Number_System_the_most_economical_way_of_representing_numbers)

Quote Notation - Eric C. R. Hehner and R. N. S. Horspool - <http://www.cs.toronto.edu/~hehner/ratno.pdf>

https://en.wikipedia.org/wiki/Quote_notation

Beyond the Complexes: Toward a lattice based number system - J. Köpflinger, J. A. Shuster

<https://www.cs.du.edu/~petr/milehigh/2013/Koeplinger.pdf>

Linear Numeral System - Ian Mackie - <http://www.ianmackie.com/papers/linns.pdf>

New approach could sink floating point computation, John Leroy Gustafson

<https://www.nextplatform.com/2019/07/08/new-approach-could-sink-floating-point-computation/>

https://en.wikipedia.org/wiki/Double-precision_floating-point_format

Unum - [https://en.wikipedia.org/wiki/Unum_\(number_format\)](https://en.wikipedia.org/wiki/Unum_(number_format))

"Strength in Numbers: Unums and the Quest for Reliable Arithmetic" by Ferris Ellis - https://www.youtube.com/watch?v=nVNYjnj_qbY

The residue logarithmic number system: Theory and implementation - Mark G. Arnold

https://www.researchgate.net/publication/4156476_The_residue_logarithmic_number_system_Theory_and_implementation

A Low-Power Two-Digit Multi-dimensional Logarithmic Number System Filterbank Architecture for a Digital Hearing Aid -- Roberto Muscedere, Vassil Dimitrov, Graham Jullien and William Miller

https://www.researchgate.net/publication/26532063_A_Low-Power_Two-Digit_Multi-dimensional_Logarithmic_Number_System_Filterbank_Architecture_for_a_Digital_Hearing_Aid

Methodology of numerical computations with infinities and infinitesimals - Yaroslav D. Sergeyev

[http://www.theinfinitycomputer.com/The_second_paper_to_read_\(Lagrange_Lecture\).pdf](http://www.theinfinitycomputer.com/The_second_paper_to_read_(Lagrange_Lecture).pdf)

<https://www.numericalinfinities.com/>

Hetero Base Arithmetic - Raghavendra Lingayya

<https://web.archive.org/web/20210213220933/http://www.numbersystem.org/hetero-base-arithmetic-operations.html>

Raghavendra's Analysis - <https://www.youtube.com/user/raanalysis/videos>

<https://www.medioq.com/XX/Unknown/122535227852808/R-Analysis-For-Real-Mathematics-Education>

<https://bangaloremirror.indiatimes.com/bangalore/others/simplifying-lessons/articleshow/21899416.cms>

Quater-imaginary base - https://en.wikipedia.org/wiki/Quater-imaginary_base

Zot-Binary: a new numbering system with an application on big-integer multiplication -- Shahram Jahani and Azman Samsudin

<http://www.jatit.org/volumes/Vol48No1/5Vol48No1.pdf>

Decimal Fractions - https://en.wikipedia.org/wiki/Simon_Stevin#Decimal_fractions

A Number System with Continuous Valued Digits and Modulo Arithmetic - Aryan Saèd, Majid Ahmadi and Graham A. Jullien -

https://www.academia.edu/13000520/A_number_system_with_continuous_valued_digits_and_modulo_arithmetic

Hereditary Base notation - https://en.wikipedia.org/wiki/Goodstein%27s_theorem#Hereditary_base-n_notation

New Arithmetic Algorithms for Hereditarily Binary natural numbers - Paul Tarau

<https://www.cse.unt.edu/~tarau/research/2014/HBinX.pdf>

Predicting Improper Fractional Base Integer Characteristics - Billy Dorminy - <http://educ.jmu.edu/~lucassk/Papers/DorminyFracBase.pdf>

Horus Eye Fractions - https://en.wikipedia.org/wiki/Eye_of_Horus#Mathematics

Egyptian geometry - https://en.wikipedia.org/wiki/Egyptian_geometry

Ancient Egyptian units of measurement - https://en.wikipedia.org/wiki/Ancient_Egyptian_units_of_measurement

Red auxiliary number - https://en.wikipedia.org/wiki/Red_auxiliary_number

Finger Binary - https://en.wikipedia.org/wiki/Finger_binary

Nemeth braille - https://en.wikipedia.org/wiki/Nemeth_Braille

A History of Mathematical Notations (Dover Books on Mathematics)

<https://www.amazon.com/History-Mathematical-Notations-Dover-Mathematics/dp/0486677664>

The Words of Mathematics : An Etymological Dictionary of Mathematical Terms used in English - Steven Schwartzman

<https://www.amazon.com/Words-Mathematics-Etymological-Dictionary-Mathematical/dp/0883855119>

J vocabulary- <https://code.jssoftware.com/wiki/NuVoc>

Bibi-binary - <https://en.wikipedia.org/wiki/Bibi-binary>

The Denormal Logarithmic Number System - Mark G. Arnold Sylvain Collange

https://www.researchgate.net/publication/262371524_The_Denormal_Logarithmic_Number_System

The generalized golden proportions, a new theory of real numbers, and ternary mirror-symmetrical arithmetic - Alexey Stakhov

<http://fs.unm.edu/SN/TheGeneralizedGolden.pdf>

Construction of Algorithms for Parallel Addition - Jan Legersky and Milena Svobodová

https://jan.legersky.cz/talks/ConstructionParAddAlg_WorkshopOnAutomaticSequences.pdf

On-line algorithms for multiplication and division in real and complex numeration systems – Marta Brzicová, Christiane Frougny, Edita Pelantová and Milena Svobodová - <https://arxiv.org/abs/1610.08309v5>

Computing with Exact Real Numbers in a Radix-r System - Alexander Kaganovsky
https://www.researchgate.net/publication/220368828_Computing_with_Exact_Real_Numbers_in_a_Radix-r_System

A variant of Ostrowski numeration - Emmanuel Cabanillas
<https://arxiv.org/pdf/1904.01874v2.pdf>

LCM number system - https://oeis.org/wiki/LCM_numeral_system
Factorial number system - https://oeis.org/wiki/Factorial_numeral_system
Factorial number system - https://en.wikipedia.org/wiki/Factorial_number_system
Primorial number system - https://oeis.org/wiki/Primorial_numeral_system
Combinadic - <http://www.thefullwiki.org/Combinadic>

Typographical Number Theory - https://en.wikipedia.org/wiki/Typographical_Number_Theory

Gödel numbering - https://en.wikipedia.org/wiki/G%C3%B6del_numbering

Octomatics number system - <http://octomatics.org/>

Sandpiles - Luis David Garcia-Puente - <http://people.reed.edu/~davidp/>
<https://www.youtube.com/watch?v=1MtEUErz7Gg>

Location arithmetic - https://en.wikipedia.org/wiki/Location_arithmetic

Yupana - <https://en.wikipedia.org/wiki/Yupana>
Yupana Inka en Matergia! - <https://www.youtube.com/watch?v=gTBEqIkhGSQ>

...some can be found in the following wikipedia links :
https://en.wikipedia.org/wiki/List_of_numeral_systems#By_culture_/time_period
https://en.wikipedia.org/wiki/Category:Non-standard_positional_numeral_systems
https://en.wikipedia.org/wiki/Non-standard_positional_numeral_systems

(4) NUMERALS BEYOND NUMERIC

Facial Action Coding System - Carl-Herman Hjortsjö, Paul Ekman and Wallace V. Friesen
https://en.wikipedia.org/wiki/Facial_Action_Coding_System#Codes_for_action_units

Notación de apreciación de intensidad emocional y partitura emocional - Susana Bloch
<https://www.casadellibro.com/ebook-surfeando-la-ola-emocional-ebook/9789568601287/2108202>
Respiratory patterns - http://onlinepdfcatalog.com/images/pdf/albaemoting.cl1-2_1.jpg
Alba Emoting - https://en.wikipedia.org/wiki/Susana_Bloch#Alba_Emoting

Plutchik's Wheel of emotions - https://en.wikipedia.org/wiki/Emotion_classification#Plutchik's_wheel_of_emotions
Interactive wheel - <https://www.6seconds.org/2022/03/13/plutchik-wheel-emotions/>

Heartmath - Doc Lew Childre Jr. - <https://www.heartmath.com/science/>

Emojitocode (code learning with emojis) - <https://www.emojicode.org/>

Laban notation - <https://en.wikipedia.org/wiki/Labanotation>
Knust's Dictionary of Kinetography Laban - <https://knustdict.netlify.app/entries>

Geometrography - <https://en.wikipedia.org/wiki/Geometrography>

A Compiler for 3D Machine Knitting - <https://la.disneyresearch.com/wp-content/uploads/A-Compiler-for-3D-Machine-Knitting-Paper.pdf>

Algoritmo del cortejo humano, heterosociabilidad y diálogo venusiano
MAX-VA-CUA-RO Secuenciado - Equipo de Seducción Científica - <https://dinamicassociales.com/>
Las 3 C's y macrohabilidades del Δ Helio - Equipo de Psicología Heterosocial - <https://www.egolandseducacion.com/>

Genealogical numbering systems - https://en.wikipedia.org/wiki/Genealogical_numbering_systems
Symbols and diagrams of the Family Tree - <https://en.wikipedia.org/wiki/Genogram#Symbols>
Six basic patterns of kinship - https://en.wikipedia.org/wiki/Kinship_terminology#Six_basic_patterns_of_kinship

WikiTree (a wiki for genealogists) - <https://www.wikitree.com/>

Reading fluids circuit diagrams : hydraulic & pneumatic symbols

<https://www.valmet.com/media/articles/up-and-running/reliability/FRFluidDwgs1/>

Electrical, pneumatic and logic symbols

<https://www.festo-didactic.com/ov3/media/customers/1100/00525179001075223667.pdf>

A Primer on Basic on Basic Hydraulic and Pneumatic Symbols

<https://3dinsider.com/basic-basic-hydraulic-and-pneumatic-symbols/>

Crash Course in Quantum Computing Using Very Colorful Diagrams - Rishabh Anand

<https://towardsdatascience.com/quantum-computing-with-colorful-diagrams-8f7861cfb6da>

Demystifying Quantum Gates One Qubit At A Time - Jason Roell

<https://towardsdatascience.com/demystifying-quantum-gates-one-qubit-at-a-time-54404ed80640>

Quantum Circuit Diagrams - <https://stem.mitre.org/quantum/quantum-concepts/quantum-circuit-diagrams.html>

Quantum logic gate - https://en.wikipedia.org/wiki/Quantum_logic_gate#/media/File:Quantum_Logic_Gates.png

Erdős number - https://en.wikipedia.org/wiki/Erd%C5%91s_number

Erdős number project - <https://sites.google.com/oakland.edu/grossman/home/the-erdoes-number-project>

Feynman diagram - https://en.wikipedia.org/wiki/Feynman_diagram

Xenharmonic (a wiki about musical tuning) - <https://en.xen.wiki/>

Universal Script - Matthew DeBlock - <http://www.dsript.org/> (Uscript is universal logographic language based on math and physics)

Kēlen Ceremonial Interlace Alphabet - <https://www.terjemar.net/kelen/lajathin.php>

Nato phonetic alphabet - https://en.wikipedia.org/wiki/NATO_phonetic_alphabet Q-code https://en.wikipedia.org/wiki/Q_code

QUANTUM-LANGUAGE-PARSE-SYNTAX-GRAMMAR (<https://dwmlc.com/>)

(an exotic grammar obtained after squashing an assembly programmer against a judge)

https://en.wikipedia.org/wiki/David_Wynn_Miller#Constructed_language_and_linguistic_theories

<https://github.com/lismore/MathematicalInterfaceForLanguage/blob/master/README.md>

: Russell-Jay: Gould. - <https://www.youtube.com/channel/UC2FPVSe66WpLdfoiQem4FzA/videos>

:QUANTUM-GRAMMAR-CHANNEL: - <https://www.youtube.com/c/QUANTUMGRAMMARCHANNEL/videos>

Neuro-optometry - Deborah G Zelinsky - <https://mindeye.com/research/>

Pen and paper exercises - Donalee Markus - <https://www.designsforstrongminds.com/paper-exercises>

Conference for the American Optometric Association - Clark Elliott - <https://www.youtube.com/watch?v=LXCoQsLYWw>

Parents with Autism: Neuroplasticity in Action - <https://www.youtube.com/watch?v=Ak7A6cMrrQM>

Lin4Neuro (neuroimaging) - https://www.nemotos.net/?page_id=29

The End of Mental Illness: How Neuroscience Is Transforming Psychiatry - Daniel G. Amen

<https://www.amazon.com/End-Mental-Illness-Neuroscience-Transforming/dp/1496438159>

The most important lesson from 83,000 brain scans - <https://www.youtube.com/watch?v=esPRsT-lmw8>

Approximate number system - https://en.wikipedia.org/wiki/Approximate_number_system

Numerical cognition - https://en.wikipedia.org/wiki/Numerical_cognition

Number sense in animals - https://en.wikipedia.org/wiki/Number_sense_in_animals

Together with dyscalculia, ageometresia, dysgraphia, financial illiteracy

Innumeracy - https://en.wikipedia.org/wiki/Innumeracy_%28book%29

Hypernumeracy - <https://www.andnextcomesl.com/2019/10/hypernumeracy.html>

WikiOdour (a wiki about odor metric) - Scentroid - <https://scentroid.com/wikiodour/>

NASA's Chief Sniffer - https://www.youtube.com/watch?v=oRdgmN_Yq3U

The perfume maker in Dubai Gold Souq who can create any fragrance - <https://www.youtube.com/watch?v=5Wlu0FxyPw>

(5) TRIANGLE ZONE

Modern triangle geometry - https://en.wikipedia.org/wiki/Modern_triangle_geometry

Trilinear Coordinates - <https://mathworld.wolfram.com/TrilinearCoordinates.html>

https://en.wikipedia.org/wiki/Incenter#Trilinear_coordinates

Transformation of trilinear and quadriplanar to and from cartesian coordinates - John B Mertie

http://www.minsocam.org/ammin/AM49/AM49_926.pdf

Special Isocubics in the Triangle Plane - Jean-Pierre Ehrmann and Bernard Gibert

<https://bernard-gibert.pagesperso-orange.fr/files/Resourcs/SITP.pdf>

The Encyclopedia of Triangle Centers - <https://faculty.evansville.edu/ck6/encyclopedia/ETC.html>
Bicentric Pairs of Points and Related Triangle Centers - Clark Kimberling - <https://forumgeom.fau.edu/FG2003volume3/FG200303.pdf>

Barycentric Coordinates - <https://mathworld.wolfram.com/BarycentricCoordinates.html>
Green Coordinates - Yaron Lipman, David Levin and Daniel Cohen-Or https://www.wisdom.weizmann.ac.il/~yilipman/GC/gc_techrep.pdf
The barycentric conspiracy - Fabian “ryg” Giesen - <https://fgiesen.wordpress.com/2013/02/06/the-barycentric-conspirac/>
Areal Coordinates - <https://mathworld.wolfram.com/ArealCoordinates.html>
Approach on area coordinate, volume coordinate and their usage in true 3dgis - Gang Liao, Qingyuan Li, Xu Chen and Jiarong Zheng
https://www.researchgate.net/publication/242605764_APPROACH_ON_AREA_COORDINATE_VOLUME_COORDINATE_AND_THEIR_USAGE_IN_TRUE_3DGIS
Areal Co-ordinate Methods in Euclidean Geometry - Tom Lovering - <https://bmos.ukmt.org.uk/home/areals.pdf>

Synergetics Coordinates - <https://mathworld.wolfram.com/SynergeticsCoordinates.html>
Clifford J. Nelson 's Wolfram Notebooks
Buckminster Fuller Notebooks - <https://library.wolfram.com/infocenter/MathSource/600/>
Bucky Number Mandelbrot - <https://library.wolfram.com/infocenter/MathSource/428/>
Four Triangle Fractals using Bucky Numbers and Synergetics Coordinates - <https://library.wolfram.com/infocenter/MathSource/754/>
A Fuller Explanation The Synergetic Geometry of R. Buckminster Fuller - Amy Edmondson
<https://www.amazon.com/Fuller-Explanation-Buckminster-Fuller-ebook/dp/B002YQ2X5S>

Quadrangle coordinates - https://en.wikipedia.org/wiki/Quadrangle_coordinates
Polysign Numbers - Tim Golden - <http://www.bandtechnology.com/PolySigned/index.html>
Pacman Product for Polysigned numbers - Tanaka - <https://archive.org/details/polysignedpacmanproduct>
Notas Sobre Polisignos Y Objetos Terciarios – Kujonai - <https://vixra.org/pdf/2002.0570v1.pdf>
Understanding Polysign Numbers the Standard Way - Hagen von Eitzen - <http://www.von-eitzen.de/math/PolysignNumbers.pdf>
Lua Digital: Matemática (Portuguese Edition) Roberto Siqueira Costa
<https://www.amazon.com/Lua-Digital-Roberto-Siqueira-Costa-ebook/dp/B0118HD4V0>
Chromatic Numbers and Ternary Algebra - Kavosh Havaledarnejad
https://www.academia.edu/25274352/Chromatic_Numbers_and_Ternary_Algebra
An Euler phi function for the Eisenstein integers and some applications - Emily Gullerud, Aba Mbirika - <https://arxiv.org/abs/1902.03483>
Tropical projective space - https://en.wikipedia.org/wiki/Tropical_projective_space
Pohlke's theorem - https://en.wikipedia.org/wiki/Pohlke's_theorem

Triangular root - https://en.wikipedia.org/wiki/Triangular_number#Triangular_roots_and_tests_for_triangular_numbers

Hedronometry (Dimensionally enhanced Trigonometry) - Blue the hedronometer - <http://daylateanddollarshort.com/mathdocs/>

Trigonometry of a tetrahedron - https://en.wikipedia.org/wiki/Trigonometry_of_a_tetrahedron
Three dimensional geometry, ZOME, and the elusive tetrahedron
https://www.maths.unsw.edu.au/sites/default/files/3dgeom_zome_tetrahedron_seminar.pdf
La géométrie des tétraèdres - Philippe Tilleuil

A New and Very Long Proof of the Pythagoras Theorem - Kaushik Basu - <http://kaushikbasu.org/Pythagoras%206.pdf>

Ternary arithmetic, factorization, and the class number one problem - Aram Bingham - <https://arxiv.org/pdf/2002.02059v2.pdf>

Parallelogon - <https://en.wikipedia.org/wiki/Parallelogon>
Trigonal trapezohedral honeycomb - https://en.wikipedia.org/wiki/Trigonal_trapezohedral_honeycomb
Rhombic dodecahedral honeycomb - https://en.wikipedia.org/wiki/Rhombic_dodecahedral_honeycomb

Maxicode - <https://en.wikipedia.org/wiki/MaxiCode>

Solid Geometry with Problems and Applications - H. E. Slaughter and N. J. Lennes - <https://www.gutenberg.org/files/29807/29807-pdf.pdf>
Polyhedral angle - https://encyclopediaofmath.org/wiki/Polyhedral_angle

Cubic Pythagoras – Luis Teia (pythagoras with cubes instead of squares)
<https://wonderfulengineering.com/pythagoras-theorem-has-been-upgraded-to-3d-and-now-requires-a-120-page-proof/>
Geometry of the 3D Pythagoras' Theorem - <https://www.youtube.com/watch?v=QWPuPX5DHHI>
<https://web.archive.org/web/20170922045632/http://www.ccsenet.org/journal/index.php/jmr/article/viewFile/64646/34833>
Fermat's Theorem – a Geometrical View
https://www.researchgate.net/profile/Luis-Teia/publication/312607399_Fermat's_Theorem_-_a_Geometrical_View/links/58863f6d92851c21ff4d5825/Fermats-Theorem-a-Geometrical-View.pdf

Heavenly Mathematics The Forgotten Art of Spherical Trigonometry - Glen Van Brummelen
<https://www.amazon.com/Heavenly-Mathematics-Forgotten-Spherical-Trigonometry/dp/0691175993>

The Theorem of Trithagoras; Pythagoras is for Squares - Dave Mitchell - <https://lattice labyrinth.wordpress.com/2018/01/13/the-theorem-of-trithagoras-pythagoras-is-for-squares-the-mathsjam-2017-five-minute-presentation/>

Pythagoras theorem variation - Claudi Alsina - <http://claudi alsina.com/wp-content/uploads/2016/10/newpythlikethms.pdf>

Extended Pythagoras Theorem Using Hexagons - Luis Teia

https://www.researchgate.net/publication/356441337_Extended_Pythagoras_Theorem_Using_Hexagons

Extended Pythagoras Theorem using Triangles, and its Applications to Engineering - Luis Teia

https://www.researchgate.net/publication/357896374_Extended_Pythagoras_Theorem_using_Triangles_and_its_Applications_to_Engineering

Duocode, a parallel of the unicode standard for hexagonal typesetting - Alexander Egorov

Hex Grid Geometry for Game Developers - Herman Tulleken - <http://gamelogic.co.za/downloads/HexMath2.pdf>

Polynumbers, Norms, Metrics, and Polyingles - R R Aidagulov and M V Shamolin

https://www.researchgate.net/publication/270597014_Polynumbers_Norms_Metrics_and_Polyingles

Finsler Spaces, Bingles, Polyingles, and Their Symmetry Groups - R. R. Aidagulov and Maxim V. Shamolin

https://www.researchgate.net/publication/270597384_Finsler_Spaces_Bingles_Polyingles_and_Their_Symmetry_Groups

Taxicab Angles and Trigonometry - Kevin Thompson and Tevian Dray - <https://arxiv.org/pdf/1101.2917.pdf>

Divine Proportions: Rational Trigonometry to Universal Geometry - Norman J. Wildberger

<https://www.amazon.com/Divine-Proportions-Rational-Trigonometry-Universal/dp/097574920X>

Wildberger 's channel - <https://www.youtube.com/user/njwildberger>

Rational trigonometry - https://handwiki.org/wiki/Rational_trigonometry

Using Chinese Dumbass Notation to Find Algebraic Identities Daniel - Liu Daniel Liu

https://www.academia.edu/11576181/Using_Chinese_Dumbass_Notation_to_Find_Algebraic_Identities

Introduction to the General Trigonometry in Euclidian 2D-space - Claude Ziad Bayeh

<http://www.wseas.us/e-library/transactions/mathematics/2012/53-882.pdf>

Plimpton 322 is Babylonian exact sexagesimal trigonometry - Daniel Francis Mansfield and Norman Wildberger

https://www.researchgate.net/publication/319286288_Plimpton_322_is_Babylonian_exact_sexagesimal_trigonometry

Old Babylonian mathematics and Plimpton 322: A new understanding of the OB tablet Plimpton 322

<https://www.youtube.com/watch?v=L24GzTaOllQ>

(6) SOFTWARE ZONE

DATA STRUCTURES*

Treesheet (tree-like spreadsheet) - <http://strlen.com/treesheets/>

Blockchain (demo) - <https://andersbrownworth.com/blockchain/>

Heimer (mind map) - <https://github.com/juzzlin/Heimer>

Enso (diagrammatic coding) - <https://enso.org/language>

Orca (procedural sequencers) - <https://github.com/Hundredrabbits/Orca>

Taichi (spatially sparse multi-level data structures) - <https://github.com/taichi-dev/taichi>

Rasdaman (datacube and arrays) - <http://www.rasdaman.org/wiki>

Egison (efficient non-linear pattern matching with backtracking for non-free data type) - <https://www.egison.org/>

Eve (uniform data-processing) - <http://witheve.com/>

Fluidinfo (columnar shareable data) - <https://github.com/fluidinfo> && <https://en.wikipedia.org/wiki/Fluidinfo>

MentDB (world wide Data) - https://www.mentdb.org/mentdb_weak.html

STRUCTS* WITH META

Bedrock (meta-distro) <https://bedrocklinux.org/>

Funtoo (meta-distro) - <https://www.funtoo.org/Welcome>

T2 System Development Environment (meta-distro) - <https://t2sde.org/index.cgi/>

DL Linux (meta-meta-distro) - <https://web.archive.org/web/20181221164035/https://www.sudosatirical.com/articles/dl-linux-0-0-1-released/>

Black (reflective) - <http://pillab.is.ocha.ac.jp/~asai/Black/>

Terra (meta-programming) - <http://terralang.org/>

MetaL (meta-language) - <https://www.meta-language.net/faq.html#what>

Rinci (metadata specifications) - <https://metacpan.org/pod/Rinci#ABSTRACT>

Circle (meta-programming) - <https://www.circle-lang.org/>

Hackett (meta-programming) - <https://lexi-lambda.github.io/hackett/>

Elena (polymorphic code) - <https://github.com/ELENA-LANG/elena-lang/wiki/ELENA-Programming-Manual#overview>

Beluga (mechanizing meta-theory) - <https://www.cs.mcgill.ca/~complogic/beluga/index.html>

Hazel (incomplete programs) - <https://hazel.org/>
Autohotkey (gui and scripting automation for windows) - <https://www.autohotkey.com/>
Rosie Pattern (beyond regex) - <https://rosie-lang.org/about/>
Antipurity (self-aware interpreter) - <https://github.com/Antipurity/conceptual>
Multicompiler (defensive compiler) - <https://immunant.com/blog/2018/09/multicompiler/>
Avail (articulate programming) - <https://www.availang.org/about-avail/introduction/index.html>
Push (evolutionary computing) - <https://faculty.hampshire.edu/lspector/push.html>
Wyvern (built-in skill for large-scale design) - <https://wyvernlang.github.io/>
Gen (probabilistic) - <https://probcomp.github.io/Gen/>
Pyro (probabilistic) - <https://pyro.ai/>
Rascal (meta-programming) - <https://www.rascal-mpl.org/>
Pharo (software as objects, immersive) - <https://pharo.org/features>

SOUND*

Gwion - <https://gwion.github.io/Gwion/>
Kronos vesaronilo - <http://kronos.vesaronilo.com/>
Supercollider - <https://supercollider.github.io/>
Faust - <https://faust.grame.fr/>
Chuck - <http://chuck.cs.princeton.edu/>

NETWORKING*

Live Raizo (network simulation) - <https://sourceforge.net/projects/live-raizo/>
P4 (implement specific network behaviours) - <https://p4.org/>
Helena (browsing automation) - <https://helena-lang.org/>
Volutia (rpg-like browser) <http://www.volutia.com/>
Gather (rpg-like meetings) - <https://www.gather.town/>
Lynx (textual browser) - [https://en.wikipedia.org/wiki/Lynx_\(web_browser\)](https://en.wikipedia.org/wiki/Lynx_(web_browser))
Beaker Browser (peer-to-peer Web browser) - <https://beakerbrowser.com/>
Nyx browser (keyboard-driven browser) - <https://github.com/atlas-engineer/next>
Jolie (microservices) - <https://www.jolie-lang.org/>
Daphile (headless music server) - <https://www.daphile.com/>
Skywave linux (software defined radio servers) - <https://skywavelinux.com/>
Gotenna (off-grid mobile mesh) - <https://gotenna.com/>
Manyverse (off-grid social networking) - <https://www.manyver.se/faq/what-is-manyverse>
p2p networking - <https://www.gnunet.org/en/> <https://zeronet.io/> <https://freenetproject.org/>
Eternal-september private news server (usenet) - <http://eternal-september.org/>
Aioe.org public news server (usenet) - <https://news.aioe.org/>
Fediverse (federated servers for web-publishing) - <https://en.wikipedia.org/wiki/Fediverse>

OPERATING SYSTEM*

XOD.IO (microcontrollers) - <https://xod.io/>
Elemental Processor SIMulator - <https://wepsim.github.io/>
Mikrocodesimulator MikroSim 2010 (microcode) - http://www.mikrocodesimulator.de/index_eng.php
Katai Struct (binary data structures) - <https://kaitai.io/>
Snowdrop OS (16-Bit Operating System) - <http://sebastianmihai.com/snowdrop/>
Turbo Rascal (design of 8-bit/16-bit games)- <https://lemonspawn.com/turbo-rascal-syntax-error-expected-but-begin/>
Tunguska (a ternary computer emulator) - Viktor Lofgren - <http://tunguska.sourceforge.net/>
The Trillium Architecture - Douglas W. Jones - <http://homepage.divms.uiowa.edu/~jones/ternary/trillium.shtml>
Red (full-stack) - <https://www.red-lang.org/p/about.html>
Racket - <https://racket-lang.org/> && Neverlang - <https://cazzola.di.unimi.it/neverlang2.html> (language creation)
Rescatux - <https://www.supergrubdisk.org/rescatux/> && Parted Magic - <https://partedmagic.com/> (OSes for rescue and recovery)
Minix - <https://www.minix3.org/> && 'An Open Letter to Intel' - <https://www.cs.vu.nl/~ast/intel/>
Los Procesadores Intel tienen un Secreto Misterio - <https://www.youtube.com/watch?v=CaLb7waR6eo>
Debian-hurd (debian over Hurd) - <https://www.debian.org/ports/hurd/> https://en.wikipedia.org/wiki/GNU_Hurd
Trisquel (ubuntu over Libre-Linux) - <https://trisquel.info/>
RedoxOS - <https://doc.redox-os.org/book/ch01-06-how-redox-compares.html>
Linux From Scratch! - <https://www.linuxfromscratch.org/>

LANGUAGE*

Sono (linguistic study) - <https://github.com/Nallantli/Sono>
Quorum (evidence-oriented) - <https://quorumlanguage.com/reference.html>
Inform7 (interactive narrative, textual adventures) - <http://inform7.com/>
Poliqarp (universal concordancer for large corpora) - <http://poliqarp.sourceforge.net/about.html>
Paper generator - https://en.wikipedia.org/wiki/Paper_generator

GRAPHICS*

Curv (mathematical methods for art design)- <https://github.com/curv3d/curv>
GraRLS (static graphic images) - <http://www.grarls.org/>
KUIML (skin and GUI) - <https://www.bluecataudio.com/Vault/Skins/KUIML/>
Complexities of Color in Computing - Ellen Wondra - <https://www.youtube.com/watch?v=VCvOwoeOgv8>
Dr Huang 's Math Handbook Calculator - <http://drhuang.com/> && <http://drhuang.com/science/mathematics/software/>
Draw2D (diagrams) - <http://www.draw2d.org/draw2d/examples.html>
Threejs (creation of 3D content) - <https://threejs.org/manual/#en/fundamentals>
Video (video editing) - <https://lang.video/>

(7) CYBERNETICS

The Cybernetic Foundation of Mathematics (Semantic graphs and Labeling rules at pages 118 - 121)
https://pat.keldysh.ru/~roman/doc/Turchin/1983_Turchin_The_Cybernetic_Foundation_of_Mathematics.pdf
Valentin Turchin - <https://pat.keldysh.ru/~roman/doc/Turchin/>

Diagnosing the System for Organizations - Stafford Beer
<https://www.amazon.com/Diagnosing-System-Organizations-Stafford-Beer/dp/0471951366>
Beyond Dispute: The Invention of Team Syntegrity
<https://www.amazon.com/Beyond-Dispute-Invention-Team-Syntegrity/dp/0471944513>
Viable system model - https://en.wikipedia.org/wiki/Viable_system_model
How Many Grapes Went Into the Wine - Stafford Beer (see chapter 'The Irrelevance of Automation')
<https://www.amazon.com/Many-Grapes-Went-into-Wine/dp/0471942960>

Cybersyn - <http://www.cybersyn.cl/> && <http://wiki.p2pfoundation.net/Cybersyn>
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